



THE INSTITUTION OF ELECTRICAL ENGINEERS

ELECTRONICS RECORD

Reprinted from *PROCEEDINGS IEE* Vol. 124

1977

U. I. C. C.
FEB 14 1978
LIBRARY

The *Proceedings IEE* (prior to 1949, the *Journal*) is copyright under the Berne Convention and the International Copyright Convention. All rights reserved. Apart from any copying under the UK Copyright Act 1956, part I, section 7, whereby a single copy of an article may be supplied, under certain conditions, for the purposes of research or private study, by a library of a class prescribed by the UK Board of Trade Regulations (Statutory Instruments, 1957, no. 868), no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission of the copyright owners. Permission is, however, not required to copy abstracts of papers or articles on condition that a full reference to the source is shown. **Multiple copying of any part of the publication without permission is always illegal.**

The IEE appreciates that, on certain occasions, it could be very useful for organisations to be able to make copies of articles and papers. An IEE licensing arrangement exists whereby organisations entering into an agreement are legally entitled to make up to ten copies of an IEE paper or article. Full details may be obtained from the IEE Publishing Department, PO Box 8, Southgate House, Stevenage, Herts. SG1 1HQ, England.

Published by the Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, England
Publishing Department: PO Box 8, Southgate House, Stevenage, Herts. SG1 1HQ, England
© 1977: The Institution of Electrical Engineers

The IEE is not as a body responsible for the opinions expressed by individual authors or speakers

Printed in England by Unwin Brothers Ltd., Old Woking, Surrey

ERRATA FOR VOLUME 122 AND 123

DESHPANDE, M.D., and DAS, B.N.: 'Input admittance of a circular waveguide aperture loaded with an iris', *Proc. IEE*, 1975, 122, (8), pp. 795-799:

The authors wish to make the following corrections to their paper:

First, eqn. 33 on p. 798 should read

$$\frac{1}{n} = \frac{2ab}{a^2 - b^2} \frac{x'_{11}}{x'^2_{11} - 1} \frac{J'_1(x'_{11} b/a)}{J_1(x_{11})}$$

The other error involves Fig. 4 on p. 798. The corrected results are shown here. The variation of input admittance for $b/a < 0.2$ is not of practical interest and is, therefore, not presented in Fig. 4. It is found that no resonance takes place for $0 \leq b/a \leq 1.0$.

WATSON, P.A.: 'Survey of measurements of attenuation by rain and other hydrometeors', *Proc. IEE*, 1976, 123, (9), pp. 863-871

The author wishes to make the following correction:

The figures on the horizontal axis of Fig. 5 were incorrect. The correct Figure is given below.

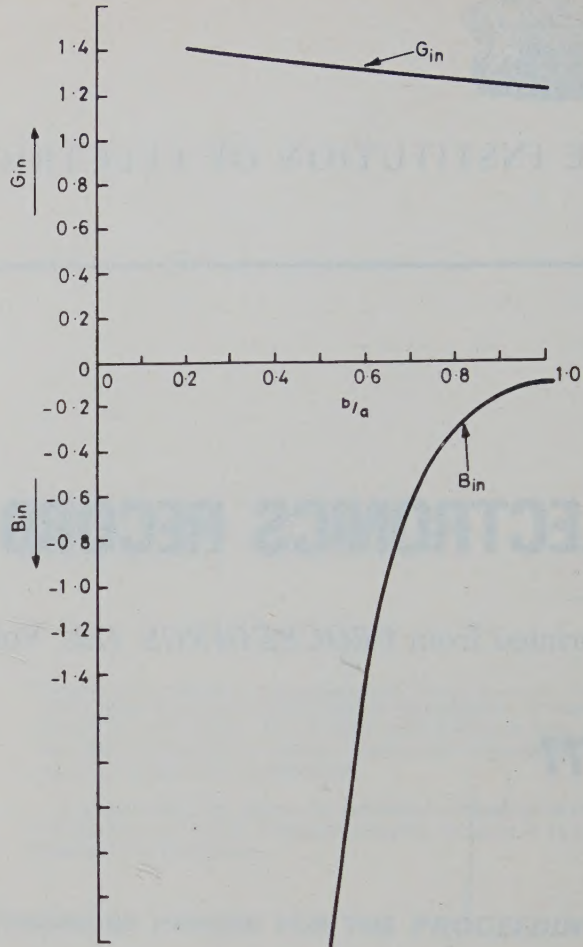
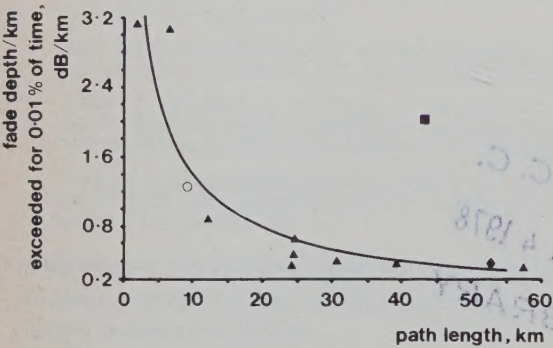


Fig. 4
 Input admittance of a circular waveguide aperture loaded with an iris

INDEX

ELECTRONICS RECORD, 1977

ABBREVIATIONS A Abstract of paper or address
E Errata
D Discussion on a paper
P Address, lecture or paper
S Synopsis of a paper published in full in a different section of the *Proceedings IEE*

Addresses

Allison, J., as Chairman of the IEE North Midland Centre A 747
Booth, E.S., as IEE President P 1
Morris, A.J., as Chairman of the IEE North Eastern Electronics and Control Section A 596

Computer-program descriptions

Keen, K.M. Computer-program system for evaluating partial and total antenna directivities from measured data A 1117

Conference publications

144 The impact of new technologies in signal processing 212
146 Millimetric waveguide systems 113
150 Displays for man-machine systems 524
159 Random signal analysis 524

Author index

A

Allison, J. Address as Chairman of the IEE North Midland Centre A 747
Allsebrook, K., and Parsons, J.D. Mobile radio propagation in British cities at frequencies in the v.h.f. and u.h.f. bands P 95
Andrews, R.S., and Turner, L.F. Amplitude fluctuation of underwater signals and its effect on the bit-error probability of underwater data-transmission systems P 115
Antoniou, A. Design of elliptic digital filters: prescribed specifications P 341

B

Barsan, R.M. Signal transfer and degradation in surface-channel charge-coupled devices P 103
Bell, D.A. Probabilistic reliability of a canonical fault-tolerant standby redundancy P 526
Benjamin, R. Orthogonally aliased Fourier transforms for the analysis of sparsely populated frequency spectra P 508
Bennett, R.G., and Gelsthorpe, R.V. (see Gelsthorpe, R.V.)
Bex, H.J. Crossmodulation in ring modulators P 1155
Blythe, J.H., and Edgcombe, K. Net coding gain of error-correcting codes D 1160
Bogle, A.G. Rectifier circuit performance: some new approximate formulas P 1127
Booth, E.S. Address as IEE President P 1
Bragg, E.J.W., Taylor, J.R., and Corbett, J.M. (see Taylor, J.R.)
Brain, D.J., and Macario, R.C.V. Software system for studying Omega-phase data and fix accuracy on a small computer P 1003

C

Cattanach, J.M., and Mars, P. (see Mars, P.)
Cattermole, K.W., and Sumner, J.P. Communication networks based on the product graph P 38
Chan, W.C., Maa, D.Y., and Chung, W.K. Discrete-time queueing system with instantaneous defection and service interruption D 444
Chung, W.K., Chan, W.C., and Maa, D.Y. (see Chan, W.C.)
Clarricoats, P.J.B., Tong, G., and James, G.L. (see Tong, G.)
Corbett, J.M., Kitchen, J.A., and Nicol, R.C. (see Kitchen, J.A.)
Corbett, J.M., Taylor, J.R., and Bragg, E.J.W. (see Taylor, J.R.)

D

Das, B.N., and Deshpande, M.D. (see Deshpande, M.D.)
Das, B.N., and Pandharipande, V.M. (see Pandharipande, V.M.)
Davies, W.S. Improved low-height antifading medium-wave antenna P 673
Deshpande, M.D., and Das, B.N. Input admittance of a circular waveguide aperture loaded with an iris E 523
Devereux, V.G. Differential coding of Pal video signals using intrafield prediction P 1139
Dube, J.D., and Majithia, J.C. (see Majithia, J.C.)
Dutta Roy, S.C. Calculation of Elmore-defined delay and rise times of RC ladder networks P 1001

E

Eaton, J.L., and Thoday, R.D.C. Computer-aided wideband antenna design in the broadcast band 11 P 519
Edgcombe, K., and Blythe, J.H. (see Blythe, J.H.)
Evans, B.G., and Holt, A.R. (see Holt, A.R.)
Evans, B.G., Uzunoglu, N.K., and Holt, A.R. (see Uzunoglu, N.K.)
Everett, D.B., Fleming, J.S., Todd, R.W., and Nightingale, J.M. Gamma-radiation imaging system based on the Compton effect P 995

F

Fleming, J.S., Everett, D.B., Todd, R.W., and Nightingale, J.M. (see Everett, D.B.)
Fox, J.R. Test-point condensation in the diagnosis of digital circuits P 89
Frangoulis, E., and Turner, L.F. Hadamard-transformation technique of speech coding: some further results P 845

G

Gelsthorpe, R.V., and Bennett, R.G. Bridge method for the accurate measurement of waveguide wall loss P 589
Gilchrist, J.H. Design of minimum-phase finite-impulse-response digital filters P 665

H

Hamid, M.A.K., and Rao, T.C.K. (see Rao, T.C.K.)
Haslett, J.W., and Kejariwal, M.L. Effects of field-dependent mobility on transfer efficiency in m.o.s. b.b.d. analogue delay lines P 109
Haslett, J.W., and Krausas, A. Noise reduction in integrated Norton amplifiers P 1121
Hassan, M.A., and Silvester, P. Radiation and scattering by wire antenna structures near a rectangular plate reflector P 429
Hobdell, J.L., and Watson, P.A. High-speed regeneration of phase-shift keying signals using phase-script logic P 1148
Holt, A.R., and Evans, B.G. Some resonance effects in scattering of microwaves by hydrometers P 1114
Holt, A.R., Uzunoglu, N.K., and Evans, B.G. (see Uzunoglu, N.K.)

J

James, G.L., Tong, G., and Clarricoats, P.J.B. (see Tong, G.)
Jones, B.E., and McNaughton, H.M. Cathode-ray-tube actuator in a noncontact analogue tachometer P 669

K

Kalikstein, K., Kleinman, C.J., Spruch, L., and Rosenberg, L. Construction of variational principles and variational bounds in waveguide scattering P 31
Kaplan, B.Z. New class of precise oscillators P 441
Keen, K.M. Computer program system for evaluating partial and total antenna directivities from measured data (Computer-program description) A 1117

Kejariwal, M.L., and Haslett, J.W. (see Haslett, J.W.)
Kinase, A. Combined effect of terrestrial diffraction and ionospheric reflection on medium-frequency sky wave propagation (Summary) P 1125
Kitchen, J.A., Nicol, R.C., and Corbett, J.M. Subjective effects of d.p.c.m. errors and predictor leak on visual telephone pictures P 737
Kleinman, C.J., Kalikstein, K., Spruch, L., and Rosenberg, L. (see Kalikstein, K.)
Kodandapani, K.L. Fault location in Reed-Muller canonic networks P 345
Kouris, S.S. Variation of E-layer critical frequency with solar activity (Summary) P 1007
Krausas, A., and Haslett, J.W. (see Haslett, J.W.)

L

Laferriere, C., and Shiva, S.G.S. On 1-step majority-logic decoding P 527
Laxpati, S.R., Papierz, A.B., and Sanzgiri, S.M. (see Papierz, A.B.)
Leakey, D.M. Switching in space and time P 17
Lewin, L. Theoretical analysis of the junction discontinuity between a straight and a curved section of rectangular waveguide P 511

M

Maa, D.Y., Chan, W.C., and Chung, W.K. (see Chan, W.C.)
Macario, R.C.V., and Brain, D.J. (see Brain, D.J.)
McNaughton, H.M., and Jones, B.E. (see Jones, B.E.)
Majithia, J.C., and Dube, J.D. Analysis and simulation of message-switched loop data networks P 193
Mars, P., and Cattanach, J.M. Automatic transcription of keyboard music P 436
Mittra, R., Parhami, P., and Rahmat-Samii, Y. (see Parhami, P.)
Morris, A.J. Address as Chairman of the IEE North Eastern Electronics and Control Section A 596

N

Naimpally, S.V. Active RC filters with zero Q-sensitivity P 754
Nicol, R.C., Kitchen, J.A., and Corbett, J.M. (see Kitchen, J.A.)
Nightingale, J.M., Everett, D.B., Fleming, J.S., and Todd, R.W. (see Everett, D.B.)

P

Pandharipande, V.M., and Das, B.N. Equivalent network of a variable-height post in a rectangular waveguide P 1160
Papierz, A.B., Sanzgiri, S.M., and Laxpati, S.R. Analysis of antenna structure with equal E- and H-plane patterns P 25
Parhami, P., Rahmat-Samii, Y., and Mittra, R. Technique for calculating the radiation and scattering characteristics of antennas mounted on a finite ground plane P 1009
Parsons, J.D., and Allsebrook, K. (see Allsebrook, K.)
Popovic, B.D. Synthesis of cylindrical antennas with continuous impedance loading P 425

- Rahmat-Samii, Y., Parhami, P., and Mittra, R. (see Parhami, P.)
 Ramsdale, P.A. Signal/noise-ratio performance of loaded wire antennas P 840
 Rao, T.C.K., and Hamid, M.A.K. Frequency bandwidth of modified Goubau line P 1017
 Rao, T.C.K., and Hamid, M.A.K. Near-field measurements over experimental modified Goubau line D 755
 Rathore, J.S., and Rathore, T.S. Common-earth fullwave rectifier D 444
 Rathore, T.S., and Rathore, J.S. (see Rathore, J.S.)
 Reynolds, F.H., and Stevens, J.W. Process-parameter variability in the manufacture of m.o.s. integrated circuits P 505
 Rogers, A.J. Method for simultaneous measurement of current and voltage on high-voltage lines using optical techniques D 992
 Rosenberg, L., Kalikstein, K., Kleinman, C.J., and Spruch, L. (see Kalikstein, K.)

S

- Sandoz, D.J., and Steiner, D.J. (see Steiner, D.J.)
 Sanzgiri, S.M., Papierz, A.B., and Laxpati, S.R. (see Papierz, A.B.)
 Satyam, M., and Viswanatha, K.V. (see Viswanatha, K.V.)
 Shiva, S.G.S., and Laferriere, C. (see Laferriere, C.)

- Silvester, P., and Hassan, M.A. (see Hassan, M.A.)
 Smith, M.S. Properties of dielectrically loaded antennas P 837
 Spruch, L., Kalikstein, K., Kleinman, C.J., and Rosenberg, L. (see Kalikstein, K.)
 Steiner, D.J., and Sandoz, D.J. Computer-aided design of thin-film optical devices (Summary) P 517
 Stevens, J.W., and Reynolds, F.H. (see Reynolds, F.H.)
 Sumner, J.P., and Cattermole, K.W. (see Cattermole, K.W.)

T

- Taylor, J.R., Bragg, E.J.W., and Corbett, J.M. Subjective quality of visual telephone pictures impaired by video crosstalk P 987
 Thoday, R.D.C., and Eaton, J.L. (see Eaton, J.L.)
 Todd, R.W., Everett, D.B., Fleming, J.S., and Nightingale, J.M. (see Everett, D.B.)
 Tong, G., Clarricots, P.J.B., and James, G.L. Evaluation of beam-scanning dual-reflector antennas P 1111
 Turner, L.F., and Andrews, R.S. (see Andrews, R.S.)
 Turner, L.F., and Frangoulis, E. (see Frangoulis, E.)

U

- Uzunoglu, N.K., Evans, B.G., and Holt, A.R. Scattering of electromagnetic radiation by pre-

cipitation particles and propagation characteristics of terrestrial and space communication systems P 417

V

- Velasevic, D. Interference suppression by multi-interval integration in analogue-digital converters P 1135
 Viswanatha, K.V., and Satyam, M. Characteristics of j.f.e.t.s. taking the separation of gate electrode from the source and drain electrodes into account (Summary) P 525

W

- Watson, P.A. Survey of measurements of attenuation by rain and other hydrometeors E 119
 Watson, P.A., and Hobdell, J.L. (see Hobdell, J.L.)
 Wilkinson, A.B. High accuracy analogue multiplier P 593
 Williams, B.W. State-space thyristor computer model P 743
 Woods, D. Multiport-network analysis by matrix renormalisation employing voltage-wave S-parameters with complex normalisation P 198
 Woods, D. Multiport network analysis by matrix renormalisation: extension to four ports P 749
 Woods, D. Reappraisal of computer-corrected network analyser design and calibration P 205

Subject index

A

- Active RC filters with zero Q-sensitivity. S.V.Naipally P 754
 Actuator, cathode-ray-tube, in a noncontact analogue tachometer. B.E.Jones and H.M.McNaughton P 669
 Adaptive and self tuning controllers. A.J.Morris A 596
 Admittance, input, of a circular waveguide aperture loaded with an iris. M.D.Deshpande and B.N.Das E 523
 Aircraft all-weather operations?, the future of (Contents of IEE Conference Publication 147) 120
 Amplifiers, integrated Norton, noise reduction in. J.W.Haslett and A.Kraus P 1121
 Amplitude fluctuation of underwater signals and its effect on the bit-error probability of underwater data-transmission systems. R.S.Andrews and L.F.Turner P 115
 Analogue-digital converters, interference suppression by multi-interval integration in. D.Velasevic P 1135
 Analyser design, computer-corrected network, reappraisal of, and calibration. D.Woods P 205
 Analysis and simulation of message-switched loop data networks. J.C.Majithia and J.D.Dube P 193
 Analysis, multiport network, by matrix renormalisation: extension to four ports. D.Woods P 749
 Analysis of antenna structure with equal E- and H-plane patterns. A.B.Papierz, S.M.Sanzgiri and S.R.Laxpati P 25
 Antenna, computer-aided wideband, design, in the broadcast band 11. J.L.Eaton and R.D.C.Thoday P 519
 Antenna directivities, total, computer-program system for evaluating partial and, from measured data. K.M.Keen (Computer-program description) A 1117
 Antenna, improved low-height antifading medium-wave. W.S.Davies P 673
 Antenna structure, analysis of, with equal E- and H-plane patterns. A.B.Papierz, S.M.Sanzgiri and S.R.Laxpati P 25
 Antenna structures, wire, radiation and scattering by, near a rectangular plate reflector. M.A.Hassan and P.Silvester P 429
 Antennas, beam-scanning dual-reflector, evaluation of. G.Tong, P.J.B.Clarricots and G.L.James P 1111
 Antennas, cylindrical, synthesis of, with continuous impedance loading. B.D.Popovic P 425
 Antennas, dielectrically loaded, properties of. M.S.Smith P 837
 Antennas, loaded wire, signal/noise ratio performance of. P.A.Ramsdale P 840
 Antennas mounted on a finite ground plane, technique for calculating the radiation and scattering characteristics of. P.Parhami, Y.Rahmat-Samii and R.Mittra P 1009
 Automatic transcription of keyboard music. P.Mars and J.M.Cattanach P 436

B

- Bridge method for the accurate measurement of waveguide wall loss. R.V.Gelsthorpe and R.G.Bennett P 589
 Broadcast band 11, computer-aided wideband antenna design in the. J.L.Eaton and R.D.C.Thoday P 519

C

- Calculation of Elmore-defined delay and rise times of RC ladder networks. S.C.Dutta Roy P 1001
 Canonical fault-tolerant standby redundancy, probabilistic reliability of a. D.A.Bell P 526
 Cathode-ray-tube actuator in a noncontact analogue tachometer. B.E.Jones and H.M.McNaughton P 669
 Characteristics of j.f.e.t.s. taking the separation of gate electrode from the source and drain electrodes into account (Summary). K.V.Viswanatha and M.Satyam P 525
 Charge-coupled devices, surface-channel, signal transfer and degradation in. R.M.Barsan P 103
 Circular waveguide, input admittance of a, aperture loaded with an iris. M.D.Deshpande and B.N.Das E 523
 Coding, differential, of Pal video signals using intrafield prediction. V.G.Devereux P 1139
 Coding, Hadamard-transformation technique of speech, some further results. E.Frangoulis and L.F.Turner P 845
 Combined effect of terrestrial diffraction and ionospheric reflection on medium-frequency sky wave propagation (Summary). A.Kinase P 1125
 Common-earth fullwave rectifier. J.S.Rathore and T.S.Rathore D 444
 Communication networks based on the product graph. K.W.Cattermole and J.P.Sumner P 38
 Computer-aided design of thin-film optical devices (Summary). D.J.Steiner and D.J.Sandoz P 517
 Computer-aided wideband antenna design in the broadcast band 11. J.L.Eaton and R.D.C.Thoday P 519
 Computer-corrected network analyser design, reappraisal of, and calibration. D.Woods P 205
 Computer model, state-space thyristor. B.W.Williams P 743
 Computer program system for evaluating partial and total antenna directivities from measured data. K.M.Keen (Computer-program description) A 1117
 Computer, small, software system for studying Omega-phase data and fix accuracy on a. D.J.Brain and R.C.V.Macario P 1003
 Construction of variational principles and variational bounds in waveguide scattering. K.Kalikstein, C.J.Kleinman, L.Spruch and L.Rosenberg P 31

- Controllers, self tuning, adaptive and. A.J.Morris A 596
 Convertors, analogue-digital, interference suppression by multi-interval integration in. D.Velasevic P 1135
 Crossmodulation in ring modulators. H.J.Bex P 1155
 Crosstalk, video, subjective quality of visual telephone pictures impaired by. J.R.Taylor, E.J.W.Bragg and J.M.Corbett P 987

D

- D.P.C.M. errors subjective effects of, and predictor leak on visual telephone pictures. J.A.Kitchen, R.C.Nicol and J.M.Corbett P 737
 Data networks, message-switched loop, analysis and simulation of. J.C.Majithia and J.D.Dube P 193
 Data-transmission systems, underwater, amplitude fluctuation of underwater signals and its effect on the bit-error probability of. R.S.Andrews and L.F.Turner P 115
 Delay, Elmore-defined, calculation of, and rise times of RC ladder networks. S.C.Dutta Roy P 1001
 Delay lines, m.o.s. b.b.d. analogue, effects of field-dependent mobility on transfer efficiency in. J.W.Haslett and M.L.Kejariwal P 109
 Design of elliptic digital filters: prescribed specifications. A.Antonioniou P 341
 Design of minimum-phase finite-impulse-response digital filters. J.H.Gilchrist P 665
 Diagnosis of digital circuits, test-point condensation in the. J.R.Fox P 89
 Dielectrically loaded antennas, properties of. M.S.Smith P 837
 Differential coding of Pal video signals using intrafield prediction. V.G.Devereux P 1139
 Diffraction, terrestrial, combined effect of, and ionospheric reflection on medium-frequency sky wave propagation (Summary). A.Kinase P 1125
 Digital circuits, test-point condensation in the diagnosis of. J.R.Fox P 89
 Digital filters, design of elliptic, prescribed specifications. A.Antonioniou P 341
 Digital filters, design of minimum-phase finite-impulse-response. J.H.Gilchrist P 665
 Discrete-time queueing system with instantaneous deflection and service interruption. W.C.Chan, D.Y.Maa and W.K.Chung D 444
 Displays for man-machine systems (Contents of IEE Conference Publication 150) 524
 Domestic applications of integrated circuits, Little is beautiful. J.Allison A 747

E

- E- and H-plane patterns, equal, analysis of antenna structure with. A.B.Papierz, S.M.Sanzgiri and S.R.Laxpati P 25

E-layer critical frequency, variation of, with solar activity (Summary). S.S.Kouris P 1007
 Effects of field-dependent mobility on transfer efficiency in m.o.s. b.b.d. analogue delay lines. J.W.Haslett and M.L.Kejariwal P 109
 Electrode, gate, characteristics of j.f.e.t.s., taking the separation of, from the source and drain electrodes into account (Summary). K.V.Viswanatha and M.Satyam P 525
 Electromagnetic radiation, scattering of, by precipitation particles and propagation characteristics of terrestrial and space communication systems. N.K.Uzunoglu, B.G.Evans and A.R.Holt P 417
 Equivalent network of a variable-height post in a rectangular waveguide. V.M.Pandharipande and B.N.Das P 1160
 Error-correcting codes, net coding gain of. J.H.Blythe and K.Edgecombe D 1160
 Errors, d.p.c.m., subjective effects of, and predictor leak on visual telephone pictures. J.A.Kitchen, R.C.Nicol and J.M.Corbett P 737
 Evaluation of beam-scanning dual-reflector antennas. G.Tong, P.J.B.Clarricoats and G.L.James P 1111

F

Fault location in Reed-Muller canonic networks. K.L.Kodandapani P 345
 Fault-tolerant standby redundancy, probabilistic reliability of a canonical. D.A.Bell P 526
 Filters, RC, active, with zero Q-sensitivity. S.V.Naipally P 754
 Fourier transforms, orthogonally aliased, for the analysis of sparsely populated frequency spectra. R.Benjamin P 508
 Frequency bandwidth of modified Goubau line. T.C.K.Rao and M.A.K.Hamid P 1017

G

Gamma-radiation imaging system based on the Compton effect. D.B.Everett, J.S.Fleming, R.W.Todd and J.M.Nightingale P 995
 Graph, product, communication networks based on the. K.W.Cattermole and J.P.Sumner P 38

H

Hadamard-transformation technique of speech coding: some further results. E.Frangoulis and L.F.Turner P 845
 High accuracy analogue multiplier. A.B.Wilkinson P 593
 High-speed regeneration of phase-shift keying signals using phase-script logic. J.L.Hobdell and P.A.Watson P 1148

I

Imaging system, gamma-radiation, based on the Compton effect. D.B.Everett, J.S.Fleming, R.W.Todd and J.M.Nightingale P 995
 Impedance loading, continuous, synthesis of cylindrical antennas with. B.D.Popovic P 425
 Improved low-height antifading medium-wave antenna. W.S.Davies P 673
 Input admittance of a circular waveguide aperture loaded with an iris. M.D.Deshpande and B.N.Das E 523
 Integrated circuits, domestic applications of, Little is beautiful -. J.Allison A 747
 Integrated Norton amplifiers, noise reduction in. J.W.Haslett and A.Krausas P 1121
 Integration, multi-interval, interference suppression by, in analogue-digital converters. D.Velasevic P 1135
 Interference suppression by multi-interval integration in analogue-digital converters. D.Velasevic P 1135
 Ionospheric reflection, combined effect of terrestrial diffraction and, on medium-frequency sky wave propagation (Summary). A.Kinase P 1125

J

J.F.E.T.s., characteristics of, taking the separation of gate electrode from the source and drain electrodes into account (Summary). K.V.Viswanatha and M.Satyam P 525

L

Ladder networks, RC, calculation of Elmore-defined delay and rise times of. S.C.Dutta Roy P 1001
 Line, Goubau, experimental modified, near-field measurements over. T.C.K.Rao and M.A.K.Hamid D 755
 Line, modified Goubau, frequency bandwidth of. T.C.K.Rao and M.A.K.Hamid P 1017

Little is beautiful - domestic applications of integrated circuits. J.Allison A 747
 Loaded antennas, dielectrically, properties of. M.S.Smith P 837

M

M.O.S. integrated circuits, process-parameter variability in the manufacture of. F.H.Reynolds and J.W.Stevens P 505
 Majority-logic decoding, 1-step, on. C.Laferriere and S.G.S.Shiva P 527
 Man-machine systems, displays for (Contents of IEE Conference Publication 150) 524
 Matrix renormalisation employing voltage-wave S-parameters, multiport-network analysis by, with complex normalisation. D.Woods P 198
 Matrix renormalisation, multiport analysis by, extension to four ports. D.Woods P 749
 Measurement, accurate, bridge method for the, of waveguide wall loss. R.V.Gelsthorpe and R.G.Bennett P 589
 Measurement, simultaneous, of current and voltage on high-voltage lines using optical techniques, method for. A.J.Rogers D 992
 Method for simultaneous measurement of current and voltage on high-voltage lines using optical techniques. A.J.Rogers D 992
 Millimetric waveguide systems (Contents of Conference Publication 146) 113
 Mobile radio propagation in British cities at frequencies in the v.h.f. and u.h.f. bands. K.All-sebrook and J.D.Parsons P 95
 Model, thyristor computer, state-space. B.W.Williams P 743
 Modulators, ring, crossmodulation in. H.J.Bex P 1155
 Multiplier, high accuracy analogue. A.B.Wilkinson P 593
 Multiport-network analysis by matrix renormalisation employing voltage-wave S-parameters with complex normalisation. D.Woods P 198
 Multiport network analysis by matrix renormalisation: extension to four ports. D.Woods P 749
 Music, keyboard, automatic transcription of. P.Mars and J.M.Cattanach P 436

N

Near-field measurements over experimental modified Goubau line. T.C.K.Rao and M.A.K.Hamid D 755
 Net coding gain of error-correcting codes. J.H.Blythe and K.Edgecombe D 1160
 Network analyser design, computer-corrected, reappraisal of, and calibration. D.Woods P 205
 Network, -multiport, analysis by matrix renormalisation employing voltage-wave S-parameters with complex normalisation. D.Woods P 198
 Network, multiport, analysis by matrix renormalisation: extension to four ports. D.Woods P 749
 Networks, communication, based on the product graph. K.W.Cattermole and J.P.Sumner P 38
 Networks, RC ladder, calculation of Elmore-defined delay and rise times of. S.C.Dutta Roy P 1001
 Networks, Reed-Muller canonic, fault location in. K.L.Kodandapani P 345
 New class of precise oscillators. B.Z.Kaplan P 441
 Noise reduction in integrated Norton amplifiers. J.W.Haslett and A.Krausas P 1121

O

On 1-step majority-logic decoding. C.Laferriere and S.G.S.Shiva P 527
 Optical devices, computer-aided design of (Summary). D.J.Steiner and D.J.Sandoz P 517
 Optical techniques, method for simultaneous measurement of current and voltage on high-voltage lines using. A.J.Rogers D 992
 Orthogonally aliased Fourier transforms for the analysis of sparsely populated frequency spectra. R.Benjamin P 508
 Oscillators, precise, new class of. B.Z.Kaplan P 441

P

Phase-shift keying signals, high-speed regeneration of, using phase-script logic. J.L.Hobdell and P.A.Watson P 1148
 Probabilistic reliability of a canonical fault-tolerant standby redundancy. D.A.Bell P 526
 Probability, bit-error, amplitude fluctuation of underwater signals and its effect on the, of underwater data-transmission systems. R.S.Andrews and L.F.Turner P 115
 Process-parameter variability in the manufacture of m.o.s. integrated circuits. F.H.Reynolds and J.W.Stevens P 505

Propagation characteristics, scattering of electromagnetic radiation by precipitation particles and, of terrestrial and space communication systems. N.K.Uzunoglu, B.G.Evans and A.R.Holt P 417
 Properties of dielectrically loaded antennas. M.S.Smith P 837

Q

Queueing system, discrete-time, with instantaneous deflection and service interruption. W.C.Chan, D.Y.Maa and W.K.Chung D 444

R

Radiation and scattering by wire antenna structures near a rectangular plate reflector. M.A.Hassan and P.Silvester P 429
 Radiation, technique for calculating the, and scattering characteristics of antennas mounted on a finite ground plane. P.Parhami, Y.Rahmat-Samii and R.Mitra P 1009
 Radio propagation, mobile, in British cities at frequencies in the v.h.f. and u.h.f. bands. K.All-sebrook and J.D.Parsons P 95
 Rain, attenuation by, survey of measurements of, and other hydrometeors. P.A.Watson E 119
 Random signal analysis (Contents of IEE Conference Publication 159) 524
 Reappraisal of computer-corrected network analyser design and calibration. D.Woods P 205
 Rectangular waveguide, equivalent network of a variable-height post in a. V.M.Pandharipande and B.N.Das P 1160
 Rectangular waveguide, theoretical analysis of the junction discontinuity between a straight and a curved section of. L.Lewin P 511
 Rectifier circuit performance: some new approximate formulas. A.G.Bogle P 1127
 Rectifier, common-earth fullwave. J.S.Rathore and T.S.Rathore D 444
 Reflection, ionospheric, combined effect of terrestrial diffraction and, on medium-frequency sky wave propagation (Summary). A.Kinase P 1125
 Reflector dual-, beam-scanning, antennas, evaluation of. G.Tong, P.J.B.Clarricoats and G.L.James P 1111
 Reflector, rectangular plate, radiation and scattering by wire antenna structures near a. M.A.Hassan and P.Silvester P 429

S

Scanning, beam-, dual-reflector antennas, evaluation of. G.Tong, P.J.B.Clarricoats and G.L.James P 1111
 Scattering characteristics, technique for calculating the radiation and, of antennas mounted on a finite ground plane. P.Parhami, Y.Rahmat-Samii and R.Mitra P 1009
 Scattering of electromagnetic radiation by precipitation particles and propagation characteristics of terrestrial and space communication systems. N.K.Uzunoglu, B.G.Evans and A.R.Holt P 417
 Scattering, radiation and, by wire antenna structures near a rectangular plate reflector. M.A.Hassan and P.Silvester P 429
 Scattering, waveguide, construction of variational principles and variational bounds in. K.Kalikestein, C.J.Kleinman, L.Spruch and L.Rosenberg P 31
 Signal analysis, random (Contents of IEE Conference Publication 159) 524
 Signal/noise-ratio performance of loaded wire antennas. P.A.Ramsdale P 840
 Signal processing, the impact of new technologies in (Contents of IEE Conference Publication 144) 212
 Signal transfer and degradation in surface-channel charge-coupled devices. R.M.Barsan P 103
 Simulation, analysis and, of message-switched loop data networks. J.C.Majithia and J.D.Dube P 193
 Software system for studying Omega-phase data and fix accuracy on a small computer. D.J.Brain and R.C.V.Macario P 1003
 Solar activity, variation of E-layer critical frequency with (Summary). S.S.Kouris P 1007
 Some resonance effects in scattering of microwaves by hydrometers. A.R.Holt and B.G.Evans P 1114
 Space communication systems, scattering of electromagnetic radiation by precipitation and propagation characteristics of terrestrial and. N.K.Uzunoglu, B.G.Evans and A.R.Holt P 417
 Spectra, sparsely populated frequency, orthogonally aliased for the analysis of, Fourier transforms. R.Benjamin P 508
 Speech coding: Hadamard-transformation technique of, some further results. E.Frangoulis and L.F.Turner P 845
 State-space thyristor computer model. B.W.Williams P 743

Subjective effects of d.p.c.m. errors and predictor leak on visual telephone pictures. J.A.Kitchen, R.C.Nicol and J.M.Corbett P 737

Subjective quality of visual telephone pictures impaired by video crosstalk. J.R.Taylor, E.J.W.Bragg and J.M.Corbett P 987

Supply industry-, the electricity, yesterday, today and tomorrow. E.S.Booth P 1

Surface-channel charge-coupled devices, signal transfer and degradation in. R.M.Barsan P 103

Survey of measurements of attenuation by rain and other hydrometeors. P.A.Watson E 119

Switching in space and time. D.M.Leakey P 17

Synthesis of cylindrical antennas with continuous impedance loading. B.D.Popovic P 425

T

Tachometer, noncontact analogue, cathode-ray-tube actuator in a. B.E.Jones and H.M.McNaughton P 669

Technique for calculating the radiation and scattering characteristics of antennas mounted on a finite ground plane. P.Parhami, Y.Rahmat-Samii and R.Mitra P 1009

Telephone pictures, visual, subjective quality of, impaired by video crosstalk. J.R.Taylor, E.J.W.Bragg and J.M.Corbett P 987

Telephone, visual, pictures, subjective effects of d.p.c.m. errors and predictor leak on. J.A.Kitchen, R.C.Nicol and J.M.Corbett P 737

Test-point condensation in the diagnosis of digital circuits. J.R.Fox P 89

The electricity supply industry-yesterday, today and tomorrow. E.S.Booth P 1

The future of aircraft all-weather operations? (Contents of IEE Conference Publication 147) 120

The impact of new technologies in signal processing (Contents of IEE Conference Publication 144) 212

Theoretical analysis of the junction discontinuity between a straight and a curved section of rectangular waveguide. L.Lewin P 511

Thyristor, state-space, computer model. B.W.Williams P 743

Transcription, automatic, of keyboard music. P.Mars and J.M.Cattanach P 436

Transformation, Hadamard, technique of speech coding: some further results. E.Frangoulis and L.F.Turner P 845

U

U.H.F. bands, mobile radio propagation in British cities at frequencies in the v.h.f. and. K.Allsebrook and J.D.Parsons P 95

Underwater signals, amplitude fluctuations of, and its effect on the bit-error probability of underwater data-transmission systems. R.S.Andrews and L.F.Turner P 115

V

V.H.F. and u.h.f. bands, mobile radio propagation in British cities at frequencies in the. K.Allsebrook and J.D.Parsons P 95

Variation of E-layer critical frequency with solar activity (Summary). S.S.Kouris P 1007

Variational bounds, construction of variational principles and, in waveguide scattering. K.Kalickstein, C.J.Kleinman, L.Spruch and L.Rosenberg P 31

Video signals, Pal, differential coding of, using intrafield prediction. V.G.Devereux P 1139

Visual telephone pictures impaired by video crosstalk, subjective quality of. J.R.Taylor, E.J.W.Bragg and J.M.Corbett P 987

Visual telephone pictures, subjective effects of d.p.c.m. errors and predictor leak on. J.A.Kitchen, R.C.Nicol and J.M.Corbett P 737

W

Wave propagation, medium-frequency sky, combined effect of terrestrial diffraction and ionospheric reflection on (Summary). A.Kinase P 1125

Waveguide scattering, construction of variational principles and variational bounds in. K.Kalickstein, C.J.Kleinman, L.Spruch and L.Rosenberg P 31

Waveguide systems, millimetric (Contents of Conference Publication 146) 113

Waveguide wall loss, bridge method for the accurate measurement of. R.V.Gelsthorpe and R.G.Bennett P 589

Index to discussion contributors

Brown, C.W., 993

Sanderson, J.H.V., 992

Stalewski, A., 992

Taysan, R., 993